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## EQUIPMENT FOR ROLLING UP A STRIP OF DOUGH

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DE4402346 (A1)  
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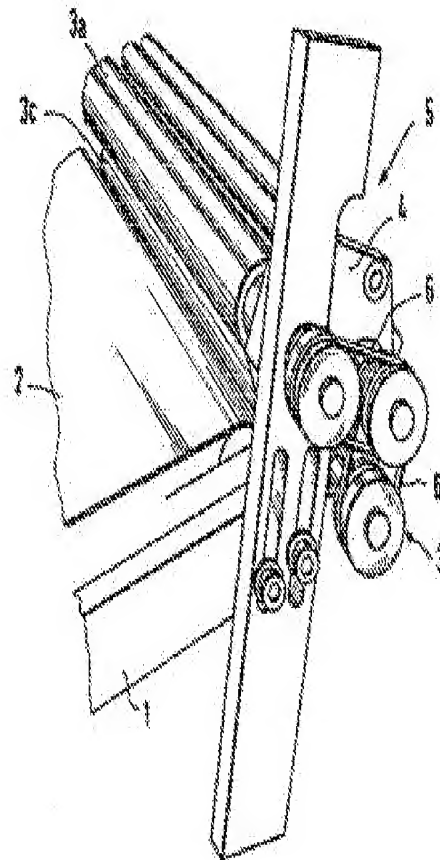
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### Abstract of WO 9520322 (A1)

The equipment described has a conveyor device, in particular a conveyor belt, for the strip of dough. Located at the delivery end of the conveyor device is a dough-rolling device which picks up the strip of dough. The dough-rolling device consist of a multiplicity of rollers grouped round the delivery end of the conveyor device and driven to rotate in the same direction, corresponding to the direction of motion of the conveyor device, being preferably the same.

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Die Erfindung betrifft eine Vorrichtung zum Aufwickeln eines Teigbandes, die eine Fördereinrichtung aufweist, die das Teigband zu einer dieses erfassenden Einrolleinrichtung bewegt. Furthermore the invention concerns a method to the production of a rolled up product of paste by rolling a paste volume up, whereby becomes made of feeding means use, which transport the paste volume to this a seizing rolling up mechanism. With this method in particular the apparatus mentioned use can find.

It is known (EP 0,204,490 B1), to move dough pieces between two vertical opposite endless belt mechanisms. The endless belt mechanisms run into opposite directions, whereby the belt of the lower mechanism becomes driven forward of quicker as the belts of the upper mechanism. Since itself the diameter of the dough piece with increased rolling up continuous enlarged to plan is an auxiliary apparatus possible with which a corresponding increasing gap between the two endless belt mechanisms is by lifting and lowering the upstream end of the upper mechanism in particular. In addition the arrangement of a pair of vertical opposite rollers additional is to be seized in the eye, so that a paste volume can become precise guided into the gap between the two belt means.

In contrast to this that is raised the invention underlying problem to be able to accomplish the paste winding with at least constant reliability with reduced construction expenditure. For this proposed according to invention become with a method with the features initially specified that the rolling up mechanism with a control drive coupled and by this opposite the feeding means into such a winding position staggered becomes that the rolling up mechanism and the feeding means the paste volume together and/or. between itself cover and umrollen. As thereby at least the feeding means implement relative movements in relation to the rolling up mechanism, these can become rolling the paste volume up out towards. After this into the desired Ringelform rolled is, the rolling up mechanism becomes into an ejection position more removed from the feeding means moved after an other formation of the invention process, so that the rolled up product of paste between the rolling up mechanism and the feeding means, in particular, feed rollers can out-arrive.

In the frame of the general inventive idea proposed according to invention becomes the solution above of the mentioned problem with an apparatus with the features initially specified that the rolling up mechanism with a plurality of rolling up rolling is realized, the which together-grouped output region of the conveyor surrounded and/or. circumscribe in such a manner that the paste volume arriving from the conveyor belt cannot arrive between the rolling up rolling through; furthermore necessary relative movement between the supply aggregate and the rolling up aggregate becomes realized in concretizing the invention thought thereby that all rolling up rolling in a same direction of rotation becomes driven, that the transportation and/or. Travelling direction of the conveyor opposite is. By these measures according to invention it is possible that with two very simple implemented aggregates, i.e. the conveyor and the rolling up roller group, the paste volume can be turned over and rolled up between them detected and in such a way that the rolled up product of paste develops.



The safety and reliability of the winding enterprise become increased, if disposed after a special formation of the invention the rolling up rolling is opposite the conveyor in different heights, and in particular the lowest rolling up roller so disposed is that a paste volume arriving from the conveyor arrives to bottom co-operation of the other rolling up roller, n upward at the lowest rolling up roller and with its tip is pushed and changed, if necessary inside.

In order to ensure itself safe covering and taking up of the rolling up paste volume, is it to be aimed at to form by the rollers as it were as large a photograph corner as possible. For this will after a formation of the invention proposed to plan at least three rolling up rolling which forms the seen corners of a triangle with different prolonged legs in the cross section and/or in the common end view, whereby the longest leg lies opposite the conveyer system output region and/or next. Thus the advantageous effect becomes achieved that the triangle with its largest, open at its sides, and/or. opposite the conveyor it is appropriate for obtuse angle the output region whereby a sufficient large receiving area the paste volume in the rolling up mechanism and/or. Rolling up roller group provided is. With particular advantage amounts to the largest angles formed of the triangle 90 DEG.

In order to be able to cause and according to invention the winding and ejection positions desired with the procedure specified above constructionally convenient, becomes after a formation of the invention proposed that becomes provided for the rolling up rolling a common adjustment support, in which these rotatably mounted are; the adjustment support for his part is in such a manner positionable with a control drive coupled and relative to the conveyor that are given for the rolling up rolling a winding position closer to the conveyor and an ejection position more removed in addition. For the realization of the control drive or several eccentric rotary turning organs, those are suitable in each case over an hinged lifting ranging at the adjustment support or one of its parts engage. A simple and above all space-saving storage of the adjustment support consists of linking this or parts of it at the basic chassis of the winding device more pivotal.

In the practical application the requirement rises to be able to work on different constituted paste volumes (varying thickness, with or without filling on its surface). In order to increase in this respect the application flexibility, the adjustment support is at least provided with two from each other separate adjustable bearing means after a formation of the invention, which are different rolling up rolling and one separate operable drive member each of the control drive associated. Thereby in particular the advantage can be obtained that the distances of the rolling up rolling to each other by displacement and/or. Positioning of the corresponding bearing means adjusted will can.

So that products of paste with as large a rolling up diameter as possible are producible, de Erfindung are at least two rolling up rolling of or several common paste retaining belts a surrounded after a favourable formation. These can be, so that they do not slip on the outer periphery of the rolling up roller, in there recessed grooves or grooves inserted and thus guided. By the paste retaining belts prevented becomes that the paste volume into the spaces and/or. Gaps between the rolling up rolling to run in knows. Also with three or more rolling up rolling it is convenient that all rolling up rolling of paste retaining belts is fundamental surrounded. Such case are those for example two rolling up rolling common paste retaining belt axial staggered disposed, and into the gaps resultant thereby other in each case paste retaining belts of next roller pairs are inserted, which exhibit the same rolling up roller with the previous roller pair. By the so staggered interdigitated, "paste retaining belts disposed on gap" convenient two successive rollers each can gap be interconnected. Altogether the advantage of an extraordinary large rolling up diameter can be reached by the idea of the paste retaining belts. By the use of the paste retaining belts, in particular if connected thereby two successive rolling up rolling each is miteina, the rollers in their diameter can become small held.

Other details, features and advantages on the base of the invention result from the Unteransprüchen and the subsequent description of preferred remark ways of the invention as well as from the designs. These show in:

Fig. 1 in perspective view an example for an apparatus according to invention,



Fig. 2 a schematic side view of this apparatus,

Fig. 3 a schematic, Fig. 2 corresponding view of the apparatus in winding position,

Fig. 4 a corresponding view of the apparatus in ejection position,

Fig. 5 a schematic side view of this apparatus with changed rolling distances,

Fig. 6 in side view an other embodiment in winding position,

Fig. 7 the apparatus in accordance with Fig. 6 in ejection position,

Fig. 8 in schematic side view an other embodiment with paste retaining belts,

Fig. 9 in corresponding illustration an other embodiment with paste retaining belts, and

Fig. 10 the remark principle with paste retaining belts in accordance with Fig. 9 in isometric and more detailed illustration.

In accordance with Fig. 1 are at the basic chassis 1 of the apparatus for rolling a paste volume up a conveyor belt 2 and one this immediate subsequent rolling up mechanism 3 mounted. This points three rolling up rolling 3a, 3b and 3c (see. also Fig. 2-4) up, which are in Lagerschilden 4 of a common adjustment support 5 rotatable fixed. All rolling up rolling 3a, 3b, 3c is at their ends at the outside of the adjustment support 5 over a multiple belt drive 6 in each case in the same direction and/or. Direction of rotation 7 the corresponding clockwise direction driven. The drive can be made for example by DC motor, which are not drawn. In the same direction of rotation 7 likewise the driving roller 8 in the output region of the conveyor belt is 2 driven, so that the conveying direction resultant from it (vgl. Fig. 4) , those corresponds to the transport motion 10 the paste volume 11, in particular its front end, by which rolling up rolling becomes 3a, 3b, 3c issued.

The rolling up rolling 3a, 3b, 3c is disposed opposite the conveyor belt 2 in different heights. Their axes of rotation 12 form the corners of a triangle with an angle somewhat larger as 90 DEG. , The longest triangle thigh resultant thereby is appropriate itself for the output region and/or. the output driving roller 8 of the conveyor belt 2 more immediate opposite, so that the paste volume with its front end can find the corresponding transport motion 10 in the corner of the triangle receiving space, which is formed of the angle large as 90 DEG.

In the embodiment in accordance with Fig. the axis of rotation 12a of the rolling up roller 3a, those forms 1-4 in the winding position in accordance with Fig. most highly, a pivotal axis for the end shield 4 with the two other rolling up rolling 3b, 3c is appropriate for 1-3. In the winding position that is end shield 4 around the trick and pivotal axis 12a the corresponding downward pivotal movement 13 in accordance with Fig. 2 or 3 downward swung. In this position a paste volume 11 is pushed upward on the conveyor belt 2 with its tip by the lowest rolling up roller 3c, so that the transport motion 10 develops. This becomes gradually completed by the other rolling up rolling 3b, 3a, until in Fig. 4 suggested, finished rolled up product of paste 14 with the desired Ringelform achieved is. So that this away-transported can become, is 15 disposed opposite the first conveyor belt 2 deep convenient, second conveyor belt. Over the product of paste from the enclosure and/or. Claspung, which by the corresponding triangle form grouped rolling up rolling 3a-3c effected will to solve becomes that upward end shield 4 a corresponding upward pivotal movement 17 by (not shown) a control drive moved. Remote itself the rolling up roller 3c so far of the conveyor driving roller 8 that the rolled up product of paste 14 from the keeping turning conveyor belt 2 on the subsequent, lowest in the winding position, second conveyor belt 15 falls down and can from this away-transported become. In accordance with Fig. 5 it is desirable to roll paste volumes up 11 which are provided in the range of their front end with a filling 11a on the surface. Such case is it convenient, the three rolling up rolling 3a-3c in the closer distance to each other than after Fig. to arrange 1-4 shown.

In accordance with Fig. 6 and 7 is the adjustment support 5 with a basic sign 18 realized, which is stationary disposed opposite the basic chassis 1 of the apparatus. At this basic sign 18 a



Schwenkschild 18 is pivoted over a countershaft 19. This is with an end shield 21 for the two upper rolling up rollers 3a, 3b connected and on the other hand more pivotable. Furthermore two eccentric cam drives 22, 23, those on an eccentric shaft 24, affect an eccentric cam element 25 and a bar 26 coupled thereby in each case exhibit, the rolling up rollers 3a-3c to their positioning and/or displacement (see. Winding position in Fig. 6 with ejection position in Fig. 7). The bar 26 of the upper eccentric cam drive 22 attacks at the end shield 21, which is pivoted at the Schwenkschild. The eccentric shaft 24 of the upper eccentric cam drive 22 is in an upper drive owner 22a disposed. Corresponding one is the lower eccentric cam drive 23 in a lower drive owner 23a positioned. Both drive owners 22a, 23a exhibit plate shape in the drawn example. The bar 26 of the lower eccentric cam drive 23 attacks at the upper drive owner 22a and/or. are there hinged. Both the upper and lower drive owners 22a, 23a and that end shield 21 are relative 18 stored pivotable to the basic sign.

In the winding position in accordance with Fig. 6 circumscribes the rolling up rollers 3a-3c the conveyor belt 2 with its output driving roller 8, so that in the defined space a product of paste wrapped and/or. to be rolled up can. In the ejection position in accordance with Fig. 7 is the eccentric cam drives 22, 23 so operated that all rolling up rollers 3a, 3b, 3c simultaneous of the output region of the conveyor belt exhibits a significant larger removal than in winding position. This is achieved by swivelling of the Schwenkschildes 18 and the lower drive owner 23a upward, whereby the simultaneous upper drive owner 22a with the end shield 21 approach upward linear moved is.

In accordance with Fig. 8 is the rolling up mechanism 3 with four rolling up rollers 3a, 3b, 3c, 3d realized, which is grouped around the output region of the conveyor belt 8 around to its boundary. The arrangement of the rolling up rollers 3a-3d is such that their axes of rotation 12 form the corners of a partly rectangular, partly skew square. The longest side of this square is appropriate thereby for the output region and/or. the output roller 8 of the conveyor belt 2 next, so that the paste volume 11 can become if possible safe received within this square. An other feature of this embodiment consists of the fact that toward the transport motion 10 of the rolling up mechanism 3 ever two successive rolling up rollers 3a and 3b, 3b and 3c and/or. 3c and 3d by preferably several common paste retaining belts 27 connected with one another are. With four rolling up rollers 3a-3d are from this three common groups of paste retaining belt 27 between these rollers, with three rolling up rollers 3a, 3b, 3c are in each case two common groups of paste retaining belts 27 between the adjacent in each case rolling up rollers 3a and 3b and/or. 3b and 3c (see. Fig. 9) necessary.

In accordance with Fig. 10 knows the rolling up rollers with extraordinary small diameter with the embodiment with paste retaining belt 27 and/or. relative large distance from each other performed its, because the paste retaining belts prevent to a large extent that dough can arrive by the spaces between the rolling up rollers 3a-3c. In accordance with Fig. 10 is everyone the rolling up rollers 3a-3c with the nearest by at least three common paste retaining belts 27a, 27b connected, which is axial staggered disposed grooves 28 guided ring-like in each case circumferential into the rolling up roller. The middle rolling up roller 3b is with the two adjacent rolling up rollers 3a and/or. 3c over ever a respective group of paste retaining belt 27a and/or. 27b connected, which covers either the highest rolling up roller 3a or the lowest rolling up roller 3c also. Due to the axial distance 31 between the paste retaining belts it is possible, the respective groups A, b von Teighalteriemen 27a, 27b of the first pair of rolling up rollers 3a, 3b and the second pair of rolling up rollers 3b to arrange 3c to each other "gap on gap": Between the upper paste retaining belt 27a, which cover the upper pair of rolling up rollers 3a, 3b common, run the lower paste retaining belts 27b, which the middle rolling up roller 3b and the lower rolling up roller 3c common surrounded.

In accordance with Fig. 1 or 10 each rolling up roller a drive pulley 29a, 29b, 29c associated can be. These can be in the frame of a two-fold belt drive by respective drive belts 30 coupled, whereby then the middle drive pulley is 29b as double wheel performed, which rotated 30 axial staggered from ever one of the two drive belts (the analogue middle rolling up roller 3b and/or. their two groups A, b von Teighalteriemen 27a, 27b).




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1. Apparatus for rolling a paste volume (11 up), with the paste volume (11) transporting conveyor, in particular conveyor belt (2), at whose output the paste volume (11) seizing rolling up mechanism (3) disposed is, characterised in that the rolling up mechanism (3) with a plurality of the output region of the conveyor circumscribing grouped rolling up rolling (3a, 3b, 3c, 3d) realized is, which in a common direction of rotation (7) driven are, that the transportation and/or. Travelling direction (9, 10) of the conveyor corresponds, rectified in particular is.
2. Apparatus according to claim 1, characterised in that the rolling up rolling (3a, 3b, 3c, 3d) opposite the conveyor in different heights disposed are.
3. Vorrichtung according to claim 2, characterized by an arrangement of the lowest rolling up roller (3c, 3d) opposite the conveyer system output region in such a manner that a paste volume (11) with its front end, arriving from the conveyor, becomes upward pushed (10) and/or turned over (10).
4. Apparatus according to claim 3, characterised in that the lowest rolling up roller (3c, 3d) within two parallel straight ones disposed is at least partial, which limit the outside diameter of the conveyor and/or the output role (8) of a possible conveyor belt (2).
5. Vorrichtung after one of the preceding claims, characterized by at least three rolling up rolling (3a, 3b, 3c), which forms the seen corners of a triangle with different prolonged legs in the cross section and/or in the common end view, whereby the longest leg lies opposite the conveyer system output region and/or next (Fig. 3, Fig. 4).
6. Apparatus according to claim 5, characterised in that the triangle rectangular and/or is equal-leg.
7. Vorrichtung after one of the preceding claims, characterised in that the rolling up rolling (3a, 3b, 3c, 3d) in a common adjustment support (5) rotatably mounted are, which at least relative (13, 17) stored such coupled with at least one control drive partial and adjustable to the conveyor it is that for the rolling up rolling (3a, 3b, 3c, 3d) one to the conveyor closer winding position (Fig. 3) and an ejection position more removed in addition (Fig. 4) given is.
8. Apparatus according to claim 7, characterised in that the control drive or several eccentric cam-like drive members (22, 23) exhibits, those in each case over a coupled bar (26) at the adjustment support (5) or one of its parts (21, 22a) engage.
9. Vorrichtung according to claim 7 or 8, characterised in that the adjustment support (5) whole or partial (20, 21, 22a, 23a) at the device round chassis (1) pivotal hinged is.
10. Apparatus according to claim 9 and 2, characterized by a linking of the adjustment support (5) around the longitudinal axis (12a) one the upper rolling up rolling (3a) in such a manner that the lowest rolling up roller (3c) into one to the conveyor closer winding position (Fig. 3) and a more distant ejection position (Fig. 4) is more adjustable.



11. Apparatus after one of the claims 7 to 10, characterised in that the adjustment support (of 5) at least two from each other separate adjustable bearing means (21, 23a) exhibits, those different rolling up rolling (3a, 3b; 3c) and ever a separate operable drive member (22; 23) the control drive associated are.

12. Vorrichtung after one of the preceding claims, characterised in that at least two rolling up rolling (3a, 3b; 3b, 3c; 3c, 3d) common from or several paste retaining belt (27) a surrounded are.

13. Apparatus according to claim 12, characterized by or several ring-like guidance recesses (28) in the outer shell of the rolling up roller (3a, 3b, 3c, 3d).

14. Vorrichtung according to claim 12 or 13, with three or more rolling up rolling (3a, 3b, 3c, 3d), characterised in that ever two each other nearest and/or adjacent rolling up rolling (3a, 3b; 3b, 3c; 3c, 3d) of or several paste retaining belt (27a; 27b) common are covered, which are axial in the distance (31) disposed to each other, whereby on one (3b) the rolling up rolling (3a, 3b, 3c, 3d) of this roller pair (3a, 3b) in the gap (31) between two paste retaining belts (27a) runs an other paste retaining belt (27b) of another roller pair (3b, 3c) with the same rolling up roller (3b).

in particular 15. Verfahren to the production of a rolled up product of paste (14) by rolling a paste volume (11 up) using an apparatus after one of the preceding claims, whereby the paste volume (11) becomes one it seizing rolling up mechanism (3) supplied, those with a control drive (22, 23) coupled is, characterised in that the rolling up mechanism (3) by means of the control drive (22, 23) opposite the feeding means (2) into such a winding position (Fig. 3, Fig. 8, Fig. 9) staggered becomes that the rolling up mechanism (3) and the feeding means (2) cover and roll the paste volume (11) together and/or between itself.

16. Process according to claim 15, characterised in that after that rollers the rolling up mechanism (3) into one of the feeding means (2) so far remote ejection position (Fig. 4) moved becomes that the rolled up product of paste (14) between the rolling up mechanism (3) and the feeding means (2) can out-arrive, in particular feed rollers.